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## Two New Species of *Machaerium* (Leguminosae) from Bahia and Southeastern Brazil

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**ABSTRACT.** Two new Brazilian species of *Machaerium* Pers. sect. *Oblonga* (Benth.) Taub. (Leguminosae) are described and illustrated. *Machaerium macaense* C. V. Mendonça, A. M. G. Azevedo & H. C. Lima is a tree species endemic to the Reserva Ecológica Macaé de Cima, an area of Atlantic forest in Rio de Janeiro State, Brazil. The species is closely similar to *M. nyctitans* (Vell.) Benth., from which it differs by its smooth bark, smaller leaflets, sunken secondary veins, narrower bracteoles, and smaller standard petal. It is also similar to *M. hatschbachii* Rudd, from which it differs by bark characters, the bracteoles that are shorter than the calyx, and its inconspicuous stigma. The second new species, *M. jobimianum* C. V. Mendonça & A. M. G. Azevedo, has a wider distribution than the first, in Minas Gerais, Espírito Santo, and Bahia states, occurring in Atlantic and mesophytic forests or as a pioneer in secondary vegetation. Its habit is a shrub, and it has been confused with *M. floridum* (Mart. ex Benth.) Ducke, from which it differs by its lustrous and glabrous leaflets, ovate bracteoles, and glabrous stamens. The species is also closely similar to *M. myrianthum* Spruce ex Benth., a vine or shrub from the Amazon Basin, which has wider paniculate inflorescences, a pandurate standard, and a longer stipe.

**RESUMO.** Duas novas espécies brasileiras de *Machaerium* Pers. sect. *Oblonga* (Benth.) Taub. (Leguminosae) são descritas e ilustradas. *Machaerium macaense* C. V. Mendonça, A. M. G. Azevedo & H.

C. Lima é uma árvore endêmica da Reserva Ecológica de Macaé de Cima, uma área de Floresta Atlântica no estado do Rio de Janeiro, Brasil. A espécie é similar a *M. nyctitans* (Vell.) Benth., da qual difere pela casca lisa, folíolos menores, com nervuras secundárias imersas, bractéolas estreitas, e estandarte menor. Ela é também similar a *M. hatschbachii* Rudd, da qual difere pelas características da casca, bractéolas menores do que o cálice e estigma inconspícuo. A segunda espécie nova *M. jobimianum* C. V. Mendonça & A. M. G. Azevedo apresenta uma distribuição mais ampla do que a primeira nos estados de Minas Gerais, Espírito Santo e Bahia, ocorrendo nas Florestas Atlântica e mesofítica, ou na vegetação secundária como pioneiras. Seu hábito é arbustivo e tem sido confundida com *M. floridum* (Mart. ex Benth.) Ducke da qual se difere pelos folíolos lustrosos e glabros, bractéolas ovatas e estames glabros. A espécie é também similar a *M. myrianthum* Spruce ex Benth. uma liana ou arbusto da Amazônia, com inflorescências paniculadas, mais amplas, estandarte panduriforme e estilete mais longo.

**Key words:** Brazil, Dalbergieae, IUCN Red List, Leguminosae, *Machaerium*.

*Machaerium* Pers. (Leguminosae, Dalbergieae) is an amphi-Atlantic genus comprising approximately 130 species with all but one species (*M. lunatum* (L. f.) Ducke) confined to the Neotropics. Baretta-Kuipers (1971) first discussed a close relationship between *Machaerium* and *Dalbergia* L. f. This



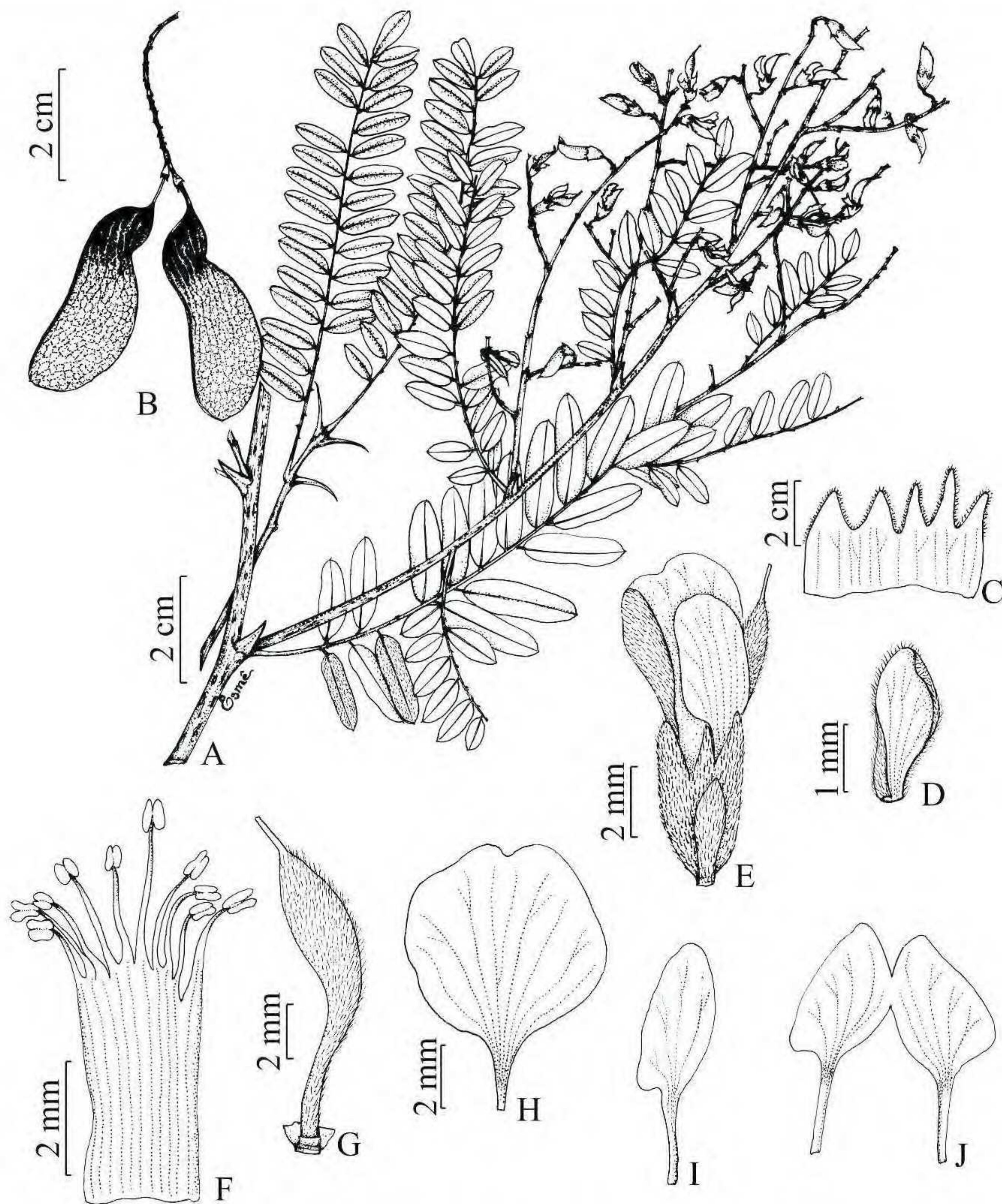


Figure 1. *Machaerium macaense* C. V. Mendonça, A. M. G. Azevedo & H. C. Lima. —A. Branches and inflorescences. —B. Fruit. —C. Calyx. —D. Bracteole. —E. Flower. —F. Androecium. —G. Gynoecium. —H. Standard petal. —I. Wing petal. —J. Keel petals. A, C–J drawn from the isotype *J. Caruso s.n.* (MBM); B drawn from the paratype *A. M. S. F. Vaz et al. 718* (NY).

relationship was later confirmed in molecular analyses by Lavin et al. (2001). More recent molecular analyses, however, still resolve *Machaerium* in the *Dalbergia* subclade, but closer to *Aeschynomene* L. subg. *Ochopodium* Vogel than to *Dalbergia* (Ribeiro et al., 2007). The species of *Machaerium* have been placed into five series by Benth (1860) based on leaflet shape as well as venation and stipule texture. These groupings were given sectional status by Taubert (1891). Rudd (1987) found it convenient to recognize only four sections for the genus. During a taxonomic revision of *Machaerium* sect. *Oblonga* (Benth.) Taub. (Mendonça Filho et al., 2007), two undescribed species came to our attention and are described here as new.

**1. *Machaerium macaense*** C. V. Mendonça, A. M. G. Azevedo & H. C. Lima, sp. nov. TYPE: Brazil. Rio de Janeiro: Nova Friburgo, Reserva Ecológica de Macaé de Cima, 16 May 1990, *J. Caruso s.n.* (holotype, RB; isotypes, K, MBM, RB). Figure 1.

Haec species a *Machaerio nyctitante* (Vell.) Benth. cortex laevi, foliolis minoribus venis secundariis impressis, bracteolis angustioribus et vexillo minore, a *M. hatschbachii* Rudd bracteolis calyce brevioribus et stigmate inconspicuo differt.

Tree 12–20 m tall, 10–30 cm DBH. Leaves 5–11 cm; stipules caducous, spinose, 8–10 × ca. 2 mm; rachis fulvous-sericeous; leaflets 19 to 27(to 37),



oblong,  $0.5\text{--}1.8 \times 0.2\text{--}0.6$  cm, petiolulate or sessile, glabrescent adaxially, white-sericeous abaxially, margin entire, apex obtuse to retuse, mucronulate, base cuneate, oblique; midvein prominent, secondary and tertiary venation sunken. Inflorescence an axillary or terminal panicle, 4–11.5 cm; bracts triangular, ca.  $2.5 \times 1$  mm; peduncle white-tomentose to sericeous. Flowers 6–9 mm, subsessile; bracteoles lanceolate, ca.  $3 \times 1$  mm; calyx  $3\text{--}4 \times 2\text{--}2.5$  mm, fulvous-sericeous; standard ca.  $6 \times 4$  mm, adaxially orbiculate, margins flavescent-tomentose, abaxially white-sericeous; petals lilac, keel petals  $6\text{--}6.5 \times 1.5\text{--}2$  mm; wing petals ca.  $6 \times 2$  mm; stamens 10, monadelphous to diadelphous (the vexillary stamen free), 5–7 mm, the free part of filaments 1.5–2 mm; style straight, 2.5–3 mm; ovary ca.  $2.5 \times 0.5$  mm. Fruit a 1-seeded samara,  $3.8\text{--}6 \times 1.2\text{--}1.3$  cm; seed chamber  $1.3\text{--}1.5 \times 0.8\text{--}1$  cm.

*Distribution and ecology.* *Machaerium macaense* is found in southeastern Brazil, in Rio de Janeiro State; it grows in the upland Atlantic forest of the Serra dos Órgãos, at elevations between 900 and 1200 m.

*IUCN Red List category.* *Machaerium macaense* is assessed as Vulnerable (VU A4c; B1ab[iii]), according to IUCN Red List criteria (IUCN, 2001).

*Phenology.* The new species was collected in flower in March, May, June, and August, and in fruit in June, September, and October.

*Etymology.* The species epithet recognizes the new species' restricted distribution in the Reserva Ecológica de Macaé de Cima.

*Discussion.* According to the sectional classification of Taubert (1891), *Machaerium macaense* assigns to section *Oblonga*, based on the multifoliolate leaves, oblong leaflets, and spinescent stipule. It is similar to *M. nyctitans* (Vell.) Benth., differing from this taxon by its smooth bark, smaller leaflets (vs.  $1.5\text{--}4 \times 0.6\text{--}2$  cm), sunken secondary veins, narrower bracteoles (vs.  $3\text{--}5 \times 0.5\text{--}1.5$  mm), and smaller standard petal (vs.  $6.4\text{--}10 \times 5\text{--}8$  mm). The species is also similar to *M. hatschbachii* Rudd, from which it differs in bark characters, the bracteoles that are shorter than the calyx (vs. as long as the calyx), and the inconspicuous stigma (vs. capitate).

*Paratypes.* BRAZIL. **Rio de Janeiro:** Nova Friburgo, Res. Ecol. de Macaé de Cima, H. C. de Lima & J. Caruso 3830 (F, P, RB, U), H. C. de Lima, F. C. Garcia & G. Laurentino 5024 (MO, RB), C. M. B. Correia, S. V. A. Pessoa, J. Caruso, L. C. Silva & J. C. Silva 99 (CEPEC, NY, RB), A. M. S. F. Vaz, L. Sylvestre, C. M. Vieira & L. C. Silva 718 (NY, RB), C. V. Mendonça & E. S. Câmara 616 (UEC).

**2. *Machaerium jobimianum*** C. V. Mendonça & A. M. G. Azevedo, sp. nov. TYPE: Brazil. Espírito Santo: Linhares, Reserva Florestal da Vale, Km 2 of rd. Bicuiba, 19 Sep. 2001, D. A. Foli 4060 (holotype, CVRD; isotype, MO). Figure 2.

Haec species a *Machaerio florido* (Mart. ex Benth.) Ducke foliolis pluribus crebrioribus pagina adaxiali nitida, bracteolis ovatis brevioribus, calyce brevior et vagina staminali glabra, a *M. myriantho* Spruce ex Benth. inflorescentia angustiore, vexillo base attenuato et fructus stipite brevior differt.

Shrubs or small trees to 3 m tall, 5–10 cm DBH. Leaves 4–7.5 cm; stipules caducous, triangular, striate, spinose,  $4\text{--}4.5 \times 1.3\text{--}1.5$  mm; rachis ferruginous-puberulent; leaflets 27 to 41, oblong,  $0.6\text{--}1.3 \times 0.2\text{--}0.4$  cm, petiolulate or sessile, glabrous, lustrous adaxially, canescent to sericeous abaxially, margin entire, apex obtuse to retuse, base cuneate, oblique; midvein prominent, secondary venation brochidodromous. Inflorescence an axillary or terminal raceme or panicle, 5–14 cm; bracts caducous; peduncle ferruginous-tomentose. Flowers 6–7 mm, subsessile; bracteoles ovate,  $0.7\text{--}1 \times 0.5\text{--}1$  mm; calyx ca.  $2 \times 1.5\text{--}2$  mm, ferruginous-sericeous to tomentose; petals cream, standard  $5\text{--}6 \times 4\text{--}4.5$  mm, orbiculate, the adaxial margins ferruginous-tomentose, the abaxial surface ferruginous-sericeous; keel petals  $5\text{--}5.5 \times$  ca. 2 mm; wing petals  $5\text{--}6 \times 1.5\text{--}2$  mm; stamens 10, monadelphous, 3–4.5 mm, the free part of filaments 1.5–2 mm; style straight, 1.5–2 mm; ovary ca.  $2 \times 0.5$  mm. Fruit a 1-seeded samara,  $4\text{--}4.5 \times$  ca. 1 cm; seed chamber ca.  $1.2 \times 0.8$  cm.

*Distribution and ecology.* *Machaerium jobimianum* is found in southeastern and northeastern Brazil, in Minas Gerais, Espírito Santo, and Bahia states; it grows in lowland Atlantic and mesophytic forests, or as a pioneer in secondary vegetation.

*IUCN Red List category.* *Machaerium jobimianum* is assessed here as Data Deficient (DD) because insufficient information is available to apply IUCN Red List criteria (IUCN, 2001).

*Phenology.* The new species was collected in flower in August and September and in fruit in September.

*Etymology.* The new species is named in honor of the Brazilian popular poet, musician, and environmental activist Antônio Carlos Jobim (1927–1994).

*Discussion.* *Machaerium jobimianum* is best assigned to *Machaerium* sect. *Oblonga* based on its multifoliolate leaves, oblong leaflets, and spinescent



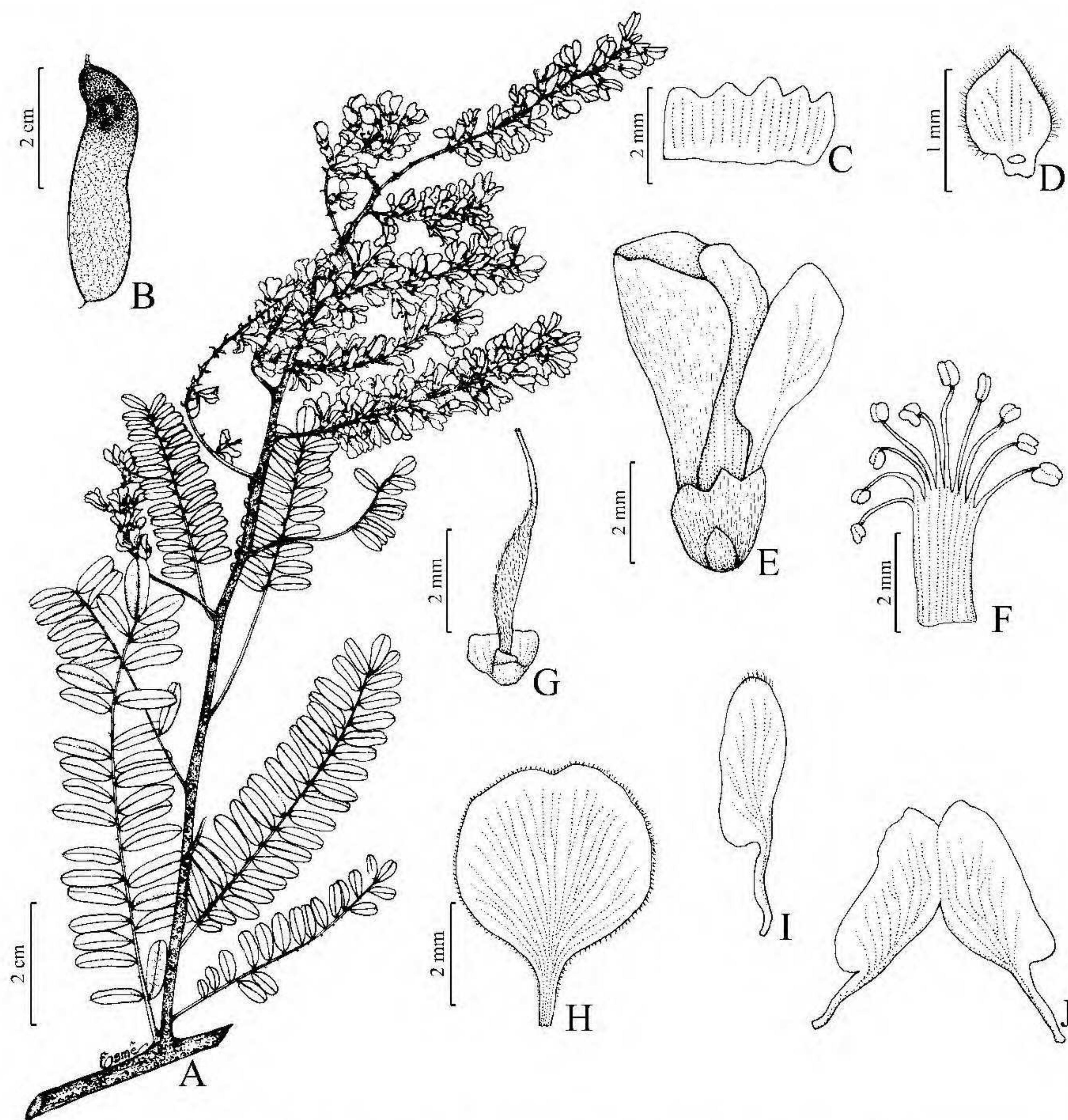


Figure 2. *Machaerium jobimianum* C. V. Mendonça & A. M. G. Azevedo. —A. Branches and inflorescences. —B. Fruit. —C. Calyx. —D. Bracteole. —E. Flower. —F. Androecium. —G. Gynoecium. —H. Standard petal. —I. Wing petal. —J. Keel petals. A, C–J drawn from the paratype *L. A. M. Silva et al.* 189 (CEPEC); B drawn from the paratype *C. V. Mendonça & D. A. Folli* 599 (UEC).

stipules. It is closely similar to *M. floridum* (Mart. ex Benth.) Ducke, but differs by its lustrous adaxial leaflet surface, its leaves with more leaflets (vs. 17 to 25 in *M. floridum*) that are more closely spaced than in *M. floridum*, its shorter ovate bracteoles and calyx (vs. 1.5–2.5 mm and 2.5–3 mm), and the glabrous marginal staminal sheath (vs. ferruginous-tomentose). The species also resembles *M. myrianthum* Spruce ex Benth., a vine or shrub from the Amazon Basin, which has paniculate inflorescences that are wider (up to 15 cm), a pandurate standard petal, and a longer fruit stipe (to 6–7 mm).

**Paratypes.** BRAZIL. **Bahia:** Macarani, Km 18 of rd. from Maiquinque to Itapetinga, *L. A. M. Silva, T. S. Santos & J. L. Lage* 189 (CEPEC). **Espírito Santo:** Linhares, Reserva Flor. Com. Vale, Km 2 of rd. Santa Terezinha, *C. V. Mendonça & D. A. Folli* 599 (CVRD, UEC). **Minas Gerais:** Águas Vermelhas, *C. V. Mendonça & R. Belinello* 625 (UEC).

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